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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,134	12/03/2001	Jeong Soo Kim	2332-0117P-SP	4564

2292 7590 10/02/2002

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

PHAM, THANH V

ART UNIT PAPER NUMBER

2823

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,134

Applicant(s)

KIM ET AL.

Examiner

Thanh V Pham

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-2 and 4-15 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In this instance, the added limitation "symmetrical" could not be found in the original specification.

3. Claims 1-2 and 4-15 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for preventing heterogeneous doping (page 3, lines 13-14, page 9, line 4 and page 10 lines 11-13), does not reasonably provide enablement for "symmetrical halo implants". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. In this instance, the specification and the figures (fig.'s 4-6, for example) do not provide any direction for that angle that could make symmetrical halo implants in the present of the mask 15.

Response to Arguments

4. The Office Action mailed 5/08/02 has a typo error in section 3 where it should be "Claims 2,5 and 9-11 are objected to because of the following informalities..."

5. Applicant's arguments in the Supplemental Amendment filed 9/17/02 (which is considered overcoming the Amendment filed 8/13/02) have been fully considered but they are not persuasive.

It is agreeable that the units for the doses are well known to those of ordinary skill in the relevant art; however, if the numbers have no unit, they cannot be understood.

Applicants argue on the support for " 8×10^{12} " in the old claim 2 is not correct. The new claim 2 is totally different than the old non-amended claim and is acceptable with " 4×10^{12} ions/cm²".

Applicants argue that Cheek et al. disclose an asymmetrical halo implant and do not disclose that the third implant would still be performed if symmetric implants were formed using the dopant process of fig.'s 5 and 6. For its intended purpose, the Cheek et al. reference teaches the forming of a device as in fig.'s 5-6 (one in various alternative embodiments), but that does not mean that the reference does not teach the symmetrical halo implants. Applicants are directed to col. 6, lines 59-64 and col. 7, lines 5-17 where Cheek et al. explain the angles of halo implantation to have a symmetric result.

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. The rejection is maintained, in view of the examiner and beside the fact of the 112 rejection, as stated in the Office action mailed 5/08/02 and is adapted as follow:

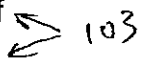
Claims 1-2 and 4-15 are rejected under 35 U.S.C. 102(a) as being anticipated by Cheek et al. U.S. Patent No. 6,372,587 B1.

The Cheek et al. reference discloses a method for forming a junction in a semiconductor device comprising:

providing a semiconductor substrate 105 divided into a first conductive type nMOS region and a second conductive type pMOS region (col. 9, line 66 to col. 10, line 12);

forming a photoresist film 510 on the second conductive type MOS region;

performing first and second halo implant processes on the first conductive type

MOS region at about a 25-65° tilt angle (col. 6, line 49) and at twist angles of  103° about 0° and 180°, respectively (col. 2, line 66 to col. 3, line 3); and

performing a third halo implant process 1200 on the first conductive type MOS region, by using a tilt angle of about 0°. ^{fig. 12}

The first and the second halo implant processes are performed with an energy of 5-70 KeV and a dose of 1.0×10^{12} - 1.0×10^{14} ions/cm²; the third halo implant process is performed with a dose of 1.0×10^{14} - 1.0×10^{15} ions/cm² and with an energy of 3-50 KeV (col. 3, lines 27-38).

(The symmetrical halo implants can be acquired by adjusting the tangent of the tilt angle of the implant process as stated in the above argument to the Remark in the Supplemental Amendment filed 9/17/02.)

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh V Pham whose telephone number is 703-308-2543. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722

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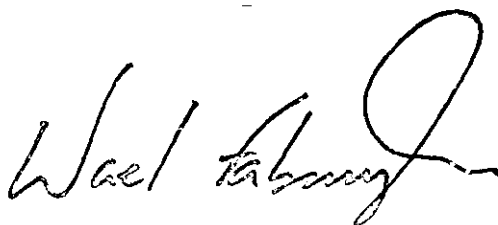
(7724, 3431 and 3432) for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TvP

TvP

September 26, 2002

A handwritten signature in black ink, appearing to read "Wael Fahmy". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800